REMARKS

The references of Bahten 6,079,662 with Rosenblatt 4,098,728 and Tomita et al. 4,566,911 were cited and applied in the parent application.

The attached Declaration of Thomas J. Drury is simply a verbal summary analysis of a product test conducted by an independent third party, who has leading edge skill and knowledge in the field and ranks as one of the top companies in the world, in the production of silicon wafer processing equipment. A copy of this test which had been previously requested to remain confidential by the testor is attached (Exhibit 1). This formal test result, by an entity which would be most critical of the results, as they have a direct bearing on the warranty, and recommended product life of the rollers used in the manufacturers machines show conclusively that the present invention has surprising results over the roller products currently being used; namely, the doubling of the effective use life of the roller, a minus defect rate and a significant reduction of chemical and water usage, any one of which would be a surprising or unexpected result. **A minus defect rate means that the inventive rollers cure manufacturing defects which occur in other areas of the chip manufacture.** The prior art rollers used during the chip cleaning process have positive defect rates meaning that certain percentages of chips were rendered unsuitable for use because of the damage caused by the roller and associated chemical and water used in cleaning. The chip machinery manufacturer was so impressed with the results of the inventive rollers that it has indicated its intention to enter into an OEM relationship with Applicant. Other testing and comment by those skilled in the art are attached in the declaration of Drury as Exhibit 2.

The present product fully meets the rigors of today's CMP methods. Some patents use starch for the pore former while others use air as the pore former. These are not combined. The invention combines all of the good physical attributes of a starch (finite sized pore former) based product Tomita/Bahten with the good attributes of a gas or air (strength, durability) formed product Rosenblatt, Cercone, to produce a product superior to any of the cited prior art. The production of product is either by starch or by air and the same are not combined in the manufacturing process.

The Rosenblatt 4,098,728 patent refers to an air or gas formed polyvinyl acetal sponge product with a very wide range of pore size. The previous cited Cercone '573 patent is an extension of the Rosenblatt '728 technology. The fact that the pore range is so wide, means that the pore size is really not controlled. A range of 10 to 200 microns produces an inconsistent product with various

pore wall thicknesses. Rosenblatt '728 has pore sizes ranging between 0.1mm to 4.0 mm (Example 1: 0.1 -0.5 mm; Example 2: 0.3 - 1.0 mm; Example 3: 0.5 - 4.0 mm; Example 6 0.25 - 1.75 mm)As the cells (pores) of the sponge are formed a bubble of air or gas is surrounded by PVA foam thereby forming a pore. With Rosenblatt '728, the pore size can not be controlled in a tight range. (See Rosenblatt '728 Col. 5 lns 28 - 40) The more open the range the greater the variability. In forming the product into a cast or molded form, these variable pores collapse on the surface and form an inconsistent skin on the surface of the sponge which is shown by Figure 4 of '573 Cercone et al and clearly teaches away from the present invention. This negatively impacts the flow rate and the surface properties of this type of roller/brush which is prone to have variable cleaning capability. In use, these brushes have even scratched the surface of the wafers rendering them useless. This product has not been readily accepted by users in the market place.

Applicant is completely familiar with Rosenblatt and Cercone having worked with both of them for a number of years.

The Tomita 4,566,911 patent which has been in existence over 17 years has a finite pore formed product which uses starch or other pore formers to produce pores in the foam in a range of 10 to 200 microns. Applicant is also familiar and knowledgeable with this product. There is no teaching of the specific narrow pore size range or flow characteristics of the present invention. With the use of a solid pore former, a finite sized grain is mixed in with the foam slurry) The cell or pore is formed when the slurry sets up around the grain. The starch acts as a bridge for the foam until the product is cured and then the starch or pore former is washed out leaving a pore. The problems with this type of foam are several fold. First, as the pore former acts as a support for the foam, the foam is weakened when the pore former is washed out. Some minor tearing can even occur during the flushing process which shows a weak stringy type pore under high magnification. These weakened pores tend to breakdown when using today's IPA based cleaning solutions, interrupting liquid flow and producing negative cleaning results. Secondly, many of the pore forming grains can remain trapped in the material after it is cured and after the material washing, only releasing in use, which causes contamination of the process. This makes for a much dirtier sponge. See the discussion in Bahten '662 below. When this product is formed, both sponge and starch combine to make a surface skin. This skin requires that the liquid flow pressure be greater to push the cleaning solution through the brush/roller. This results in higher chemistry (water and chemicals) usage and greater stress and breakdown of the skin material resulting in a shorter use life.

The Bahten 6,076,662 patent (assigned to Rippey Corporation) is primarily directed toward a cleaning device for PVA brushes. Bahten '662 specifically states that the pore size in some embodiments ranges from about 10 microns to about 200 microns and where the average pore size is less than 10 microns the material may have poor elasticity making the performance fo the cleaning roll unsatisfactory. This is basically the same recitation as that of the Tomita '911 patent. The production of Bahten '662 requires adding of a starch to form the pores but does note that other techniques such as an injected foam can be used. (Col 4 lines 45 - 49). It is also noted that other competitive brushes have more impurities. **Of significant interest is the listing on Col 7 lines 35 -44 of Bahten '662 which notes that the rollers of Merocel Scientific Products (Cercone et al '573) and Kanebo Ltd (Tomita et al '911) include a wide variety of impurities that can be detrimental to the manufacture of integrated circuits.** As noted on Col. 7 lines 33,34, the Bahten '662 process has a first step providing a plurality of porous polymeric devices which require cleaning. **These are products which have just been manufactured.** Twelve additional complex cleaning steps are required to remove particulate contamination and impurities from the porous polymeric devices. The devices are noted as being "dirty" from the manufacturing process and should be substantially cleaned before use in the manufacturing operation, e.g. semiconductor fabrication. After cleaning a preservative is added such as ammonium hydroxide or other organic biocide and the roller is then packaged. After the cleaning steps are accomplished, the product still contains a number of impurities which seriously impact on it product life and defect ratio of silicone wafters. This twelve step requirement is specifically pointed out to show that the product of Bahten '662 is inherently dirty which means that substantial impurities would remain after washing as the impurities are held in the foam during curing. There has been no prima facie rejection and the test results show that such problems are still in existence.

It is thus seen that the cited references do not teach or obviate the present invention and cannot be combined as they use different pore forming techniques in the PVA. The invention because of its specific range of pore sizes and fluid flow characteristics has a life span more than double the rollers presently being used in the marketplace, uses ½ the chemicals and water currently being used by rollers in the field which are used in the marketplace and has a negative defect rate. As previously noted the inventive rollers when cleaning the silicone wafers do not cause defects as do other competitive rollers but additionally cure manufacturing defects which occur in the production of the silicone wafers. These are solutions to a long felt need in the industry and are totally unexpected and

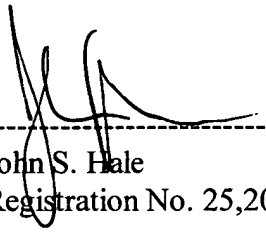
are surprising results which save large quantities of products, save a significant amount of money in a multibillion dollar industry and have significant environmental benefits.

If any additional charges are required, please charge Deposit Account Number 07-1340.

It is respectfully requested that the arguments and amendments present in the present application in condition for favorable reexamination and that the application be passed to issue.

Respectfully submitted,

GIPPLE & HALE



John S. Hale
Registration No. 25,209

6665-A Old Dominion Drive
McLean, Virginia 22101
(703) 448-1770 ext. 304
Attorney Reference: X-9332